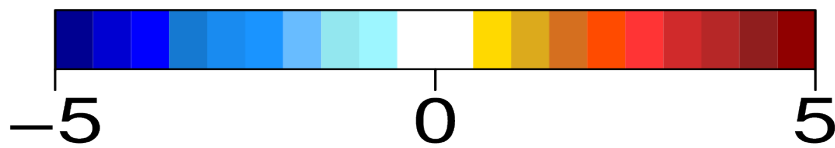
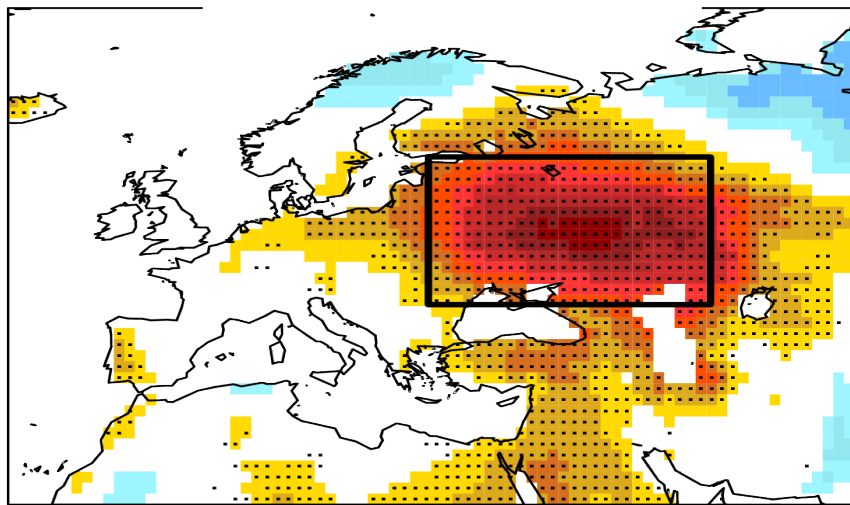
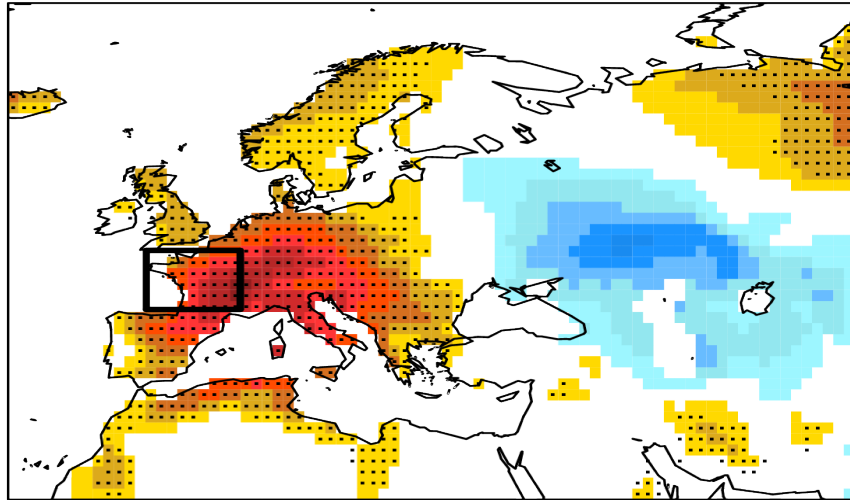


Understanding 2003 and 2010 Heat waves

Institut Català de Ciències del Clima (IC3)
C. Prodhomme, F. Doblas-Reyes, O. Bellprat, E. Dutra

SPECS General Assembly, Norrköping, SMHI, 16/09/2015

2003 and 2010 heatwaves

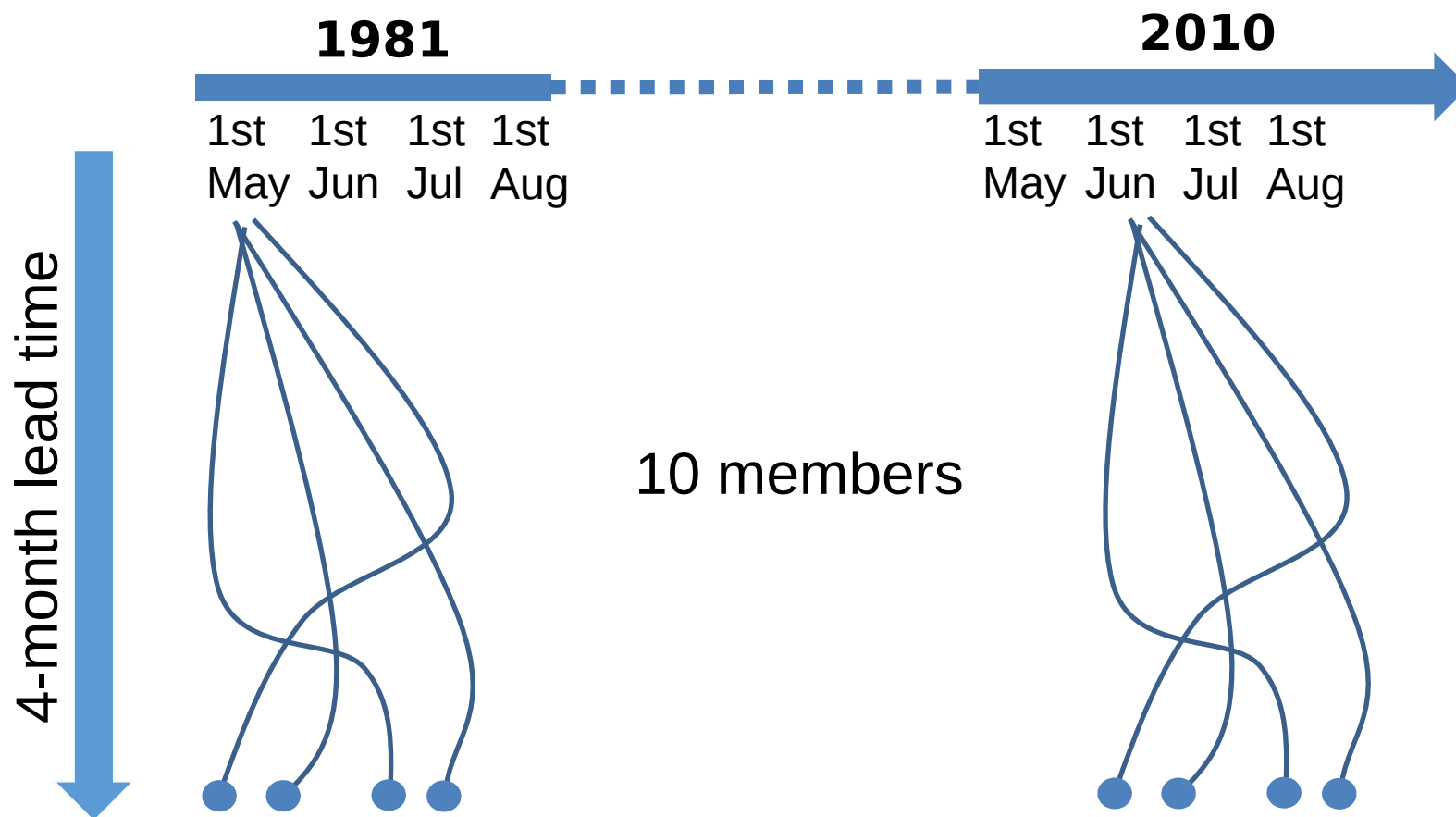


The European heat-wave of 2003 caused the death of 35,000 people and damages of \$15 billion

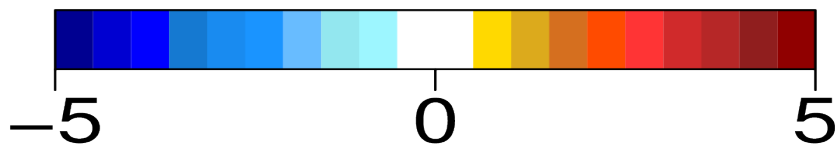
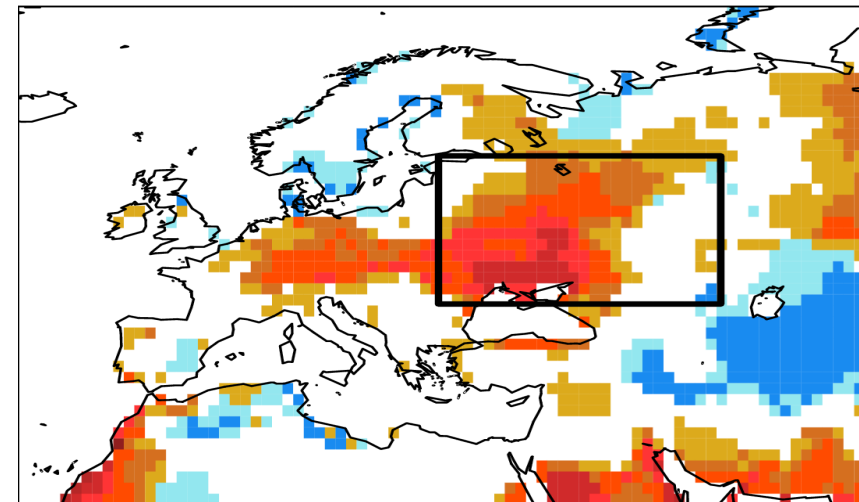
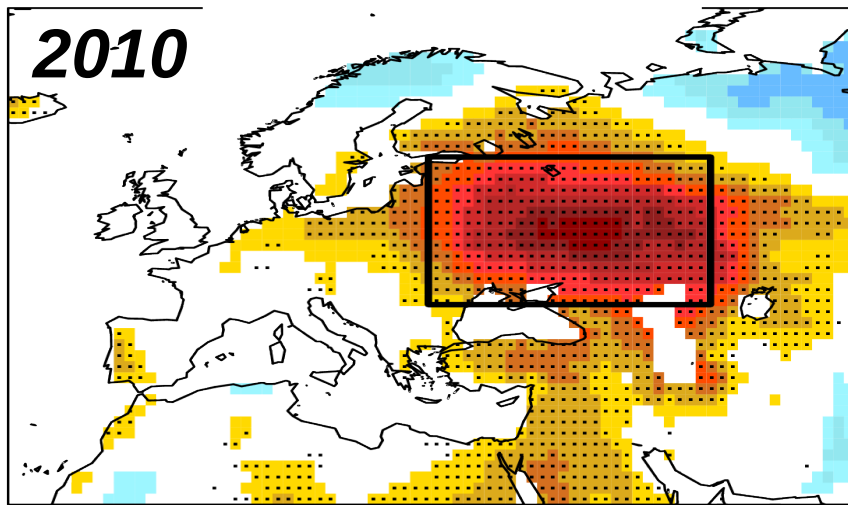
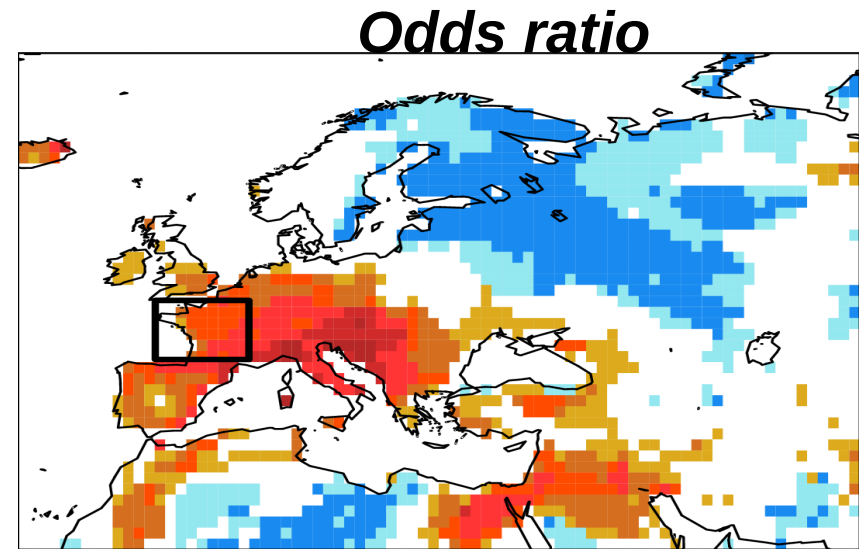
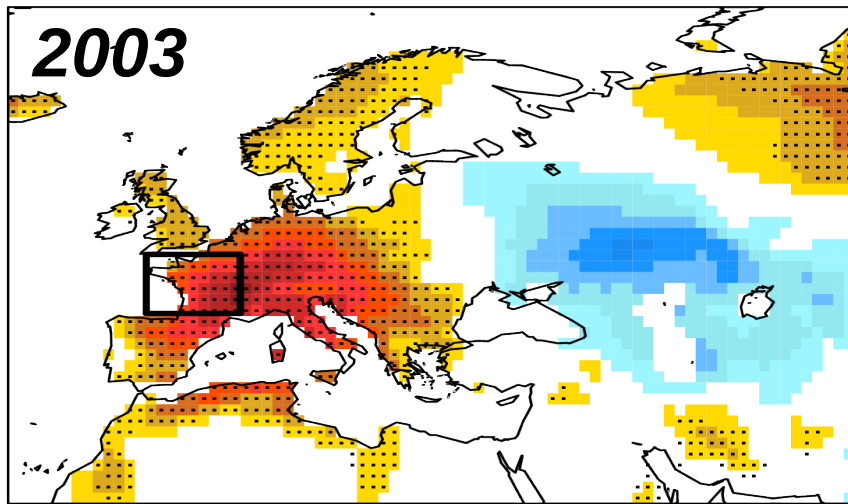


Experiments description

Model	Start dates	Land IC	Atm IC	Oce/Ice IC
EC-Earth 2.3	May , June, July, August	ERA-Land	ERAInt	ORA-S4



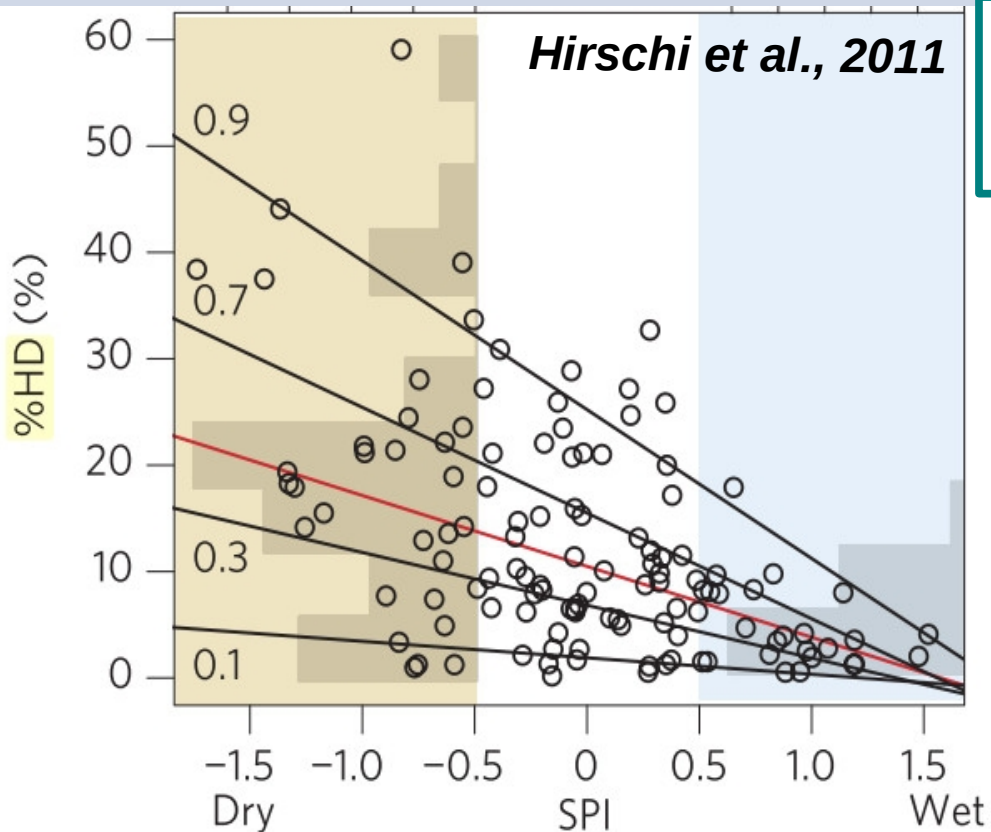
Are they predictable?



Why are they predictable?

Large scale vs local processes

Model	Start dates	Land IC	Atm IC	Oce/Ice IC
EC-Earth 2.3	May , June, July, August	ERA-Land	ERAInt	ORA-S4



**Climatology
of ERA-Land**

Percentage of Hot Days (%HD) vs the Standardized Precipitation Index (SPI) in the southeast European domain (1961–2000 period).

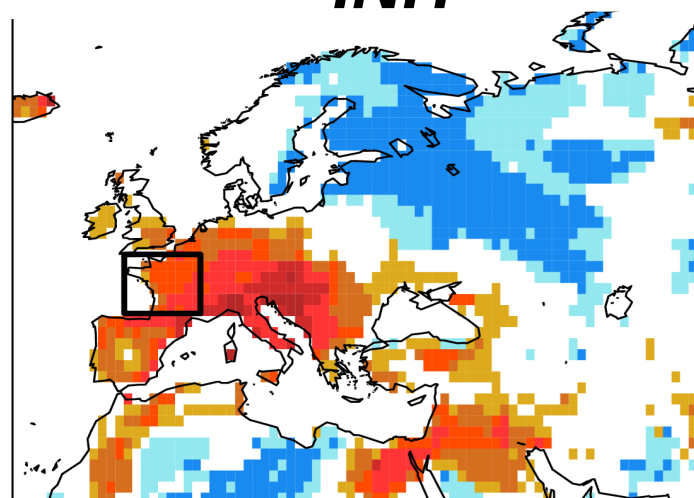
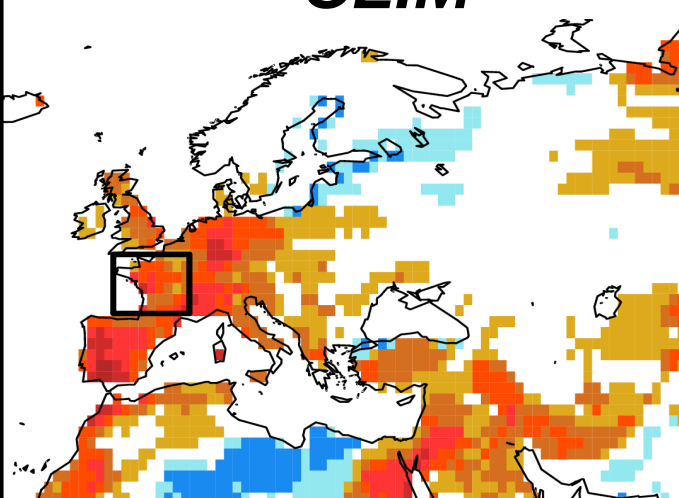
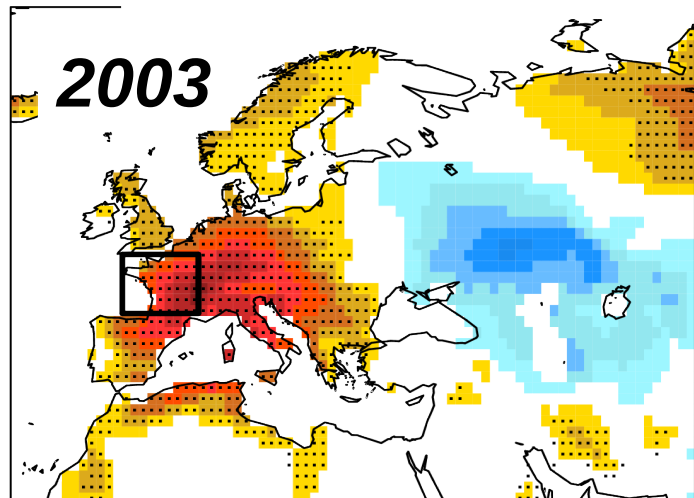
Local vs large-scale

Odds ratio

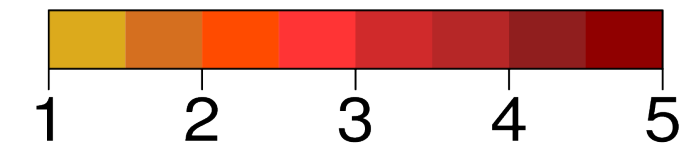
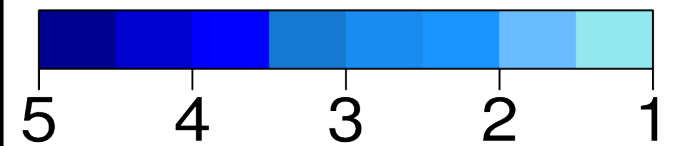
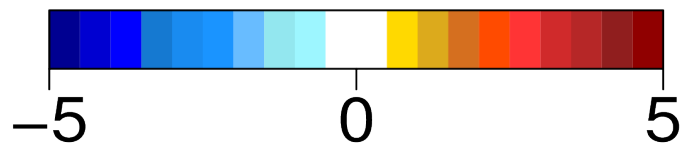
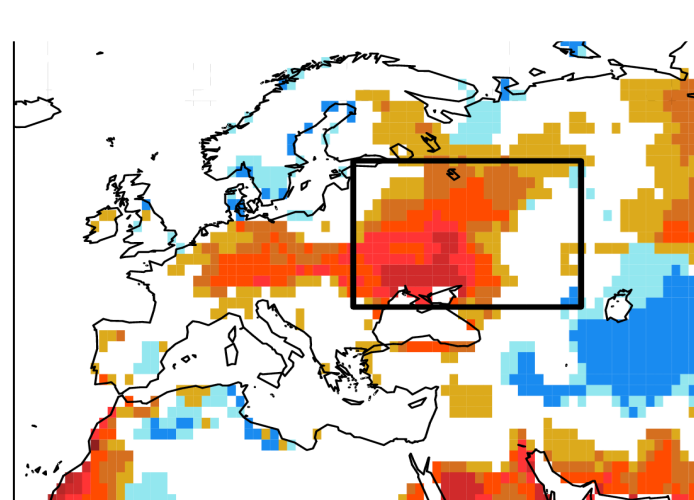
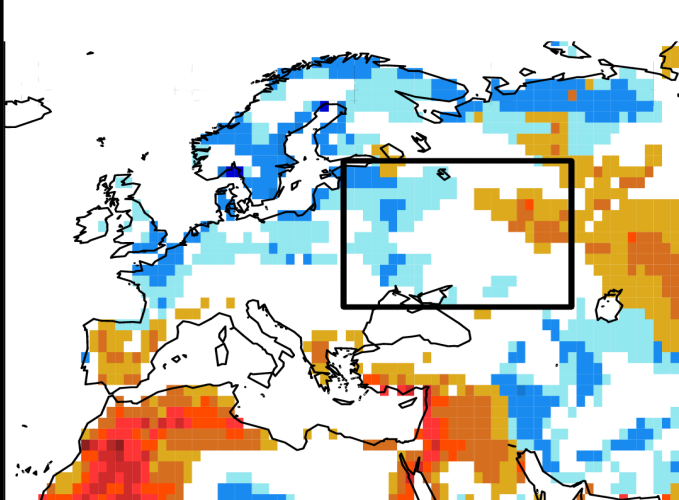
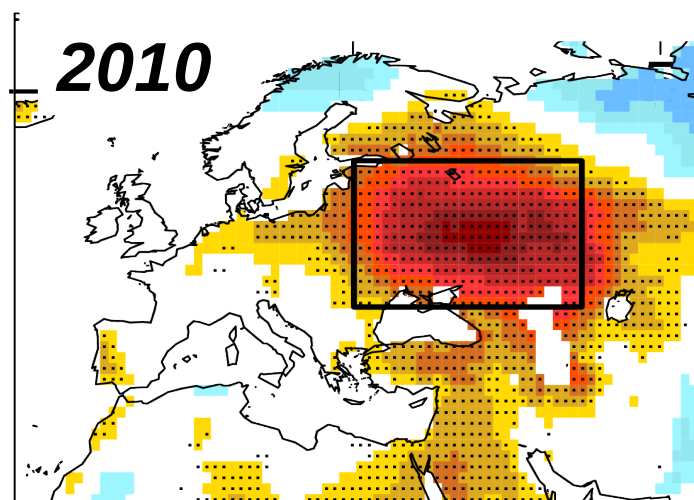
CLIM

INIT

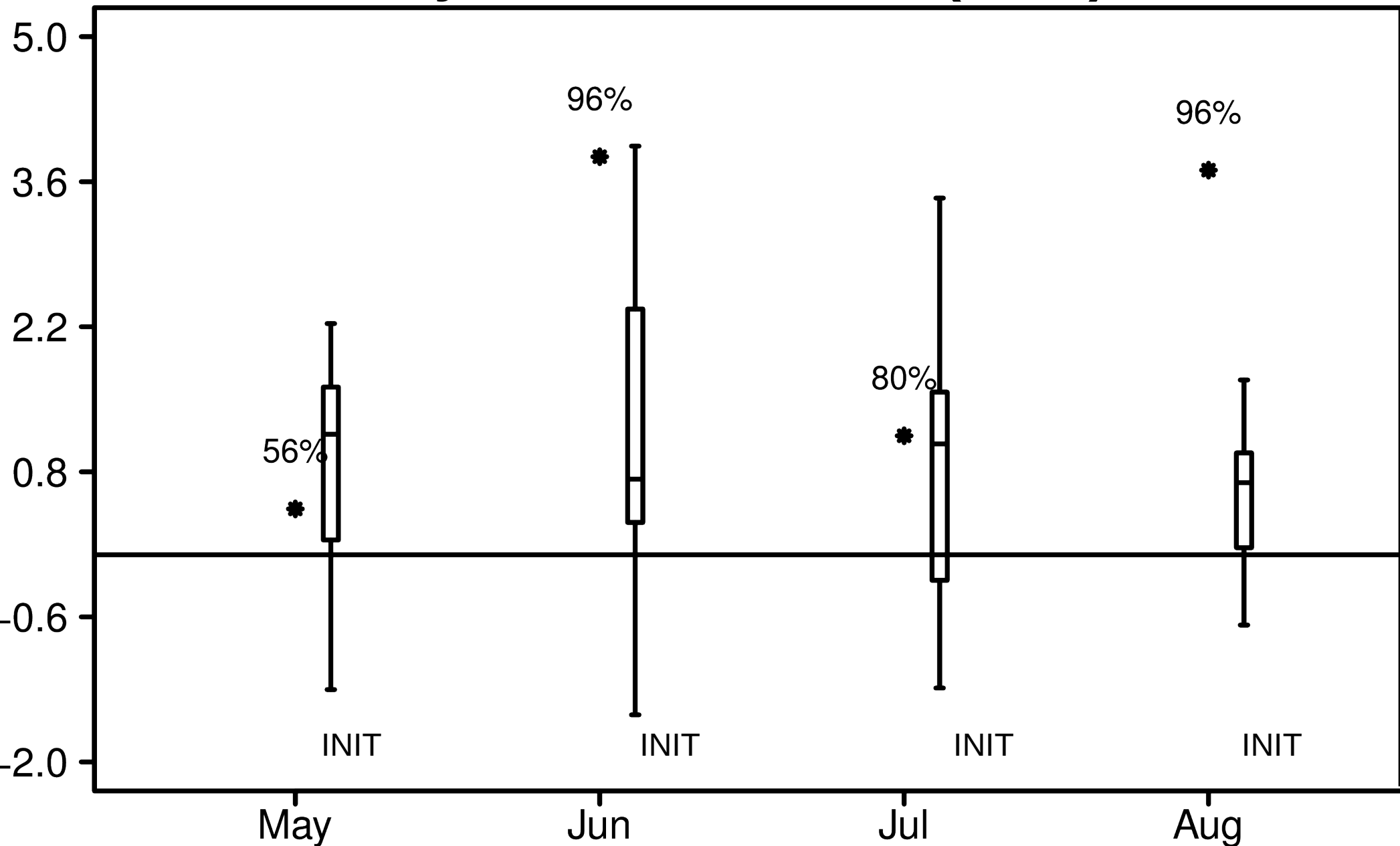
2003



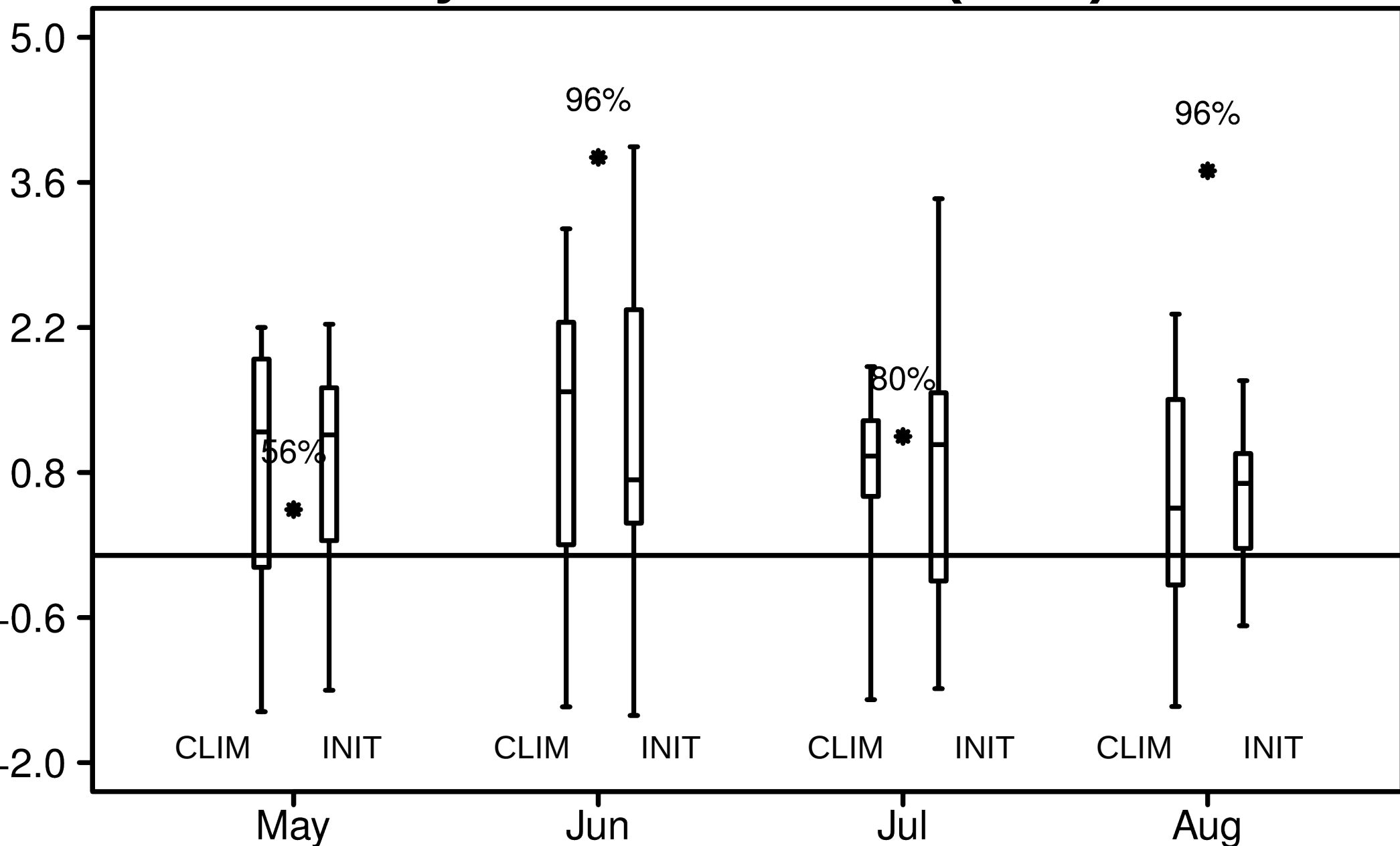
2010



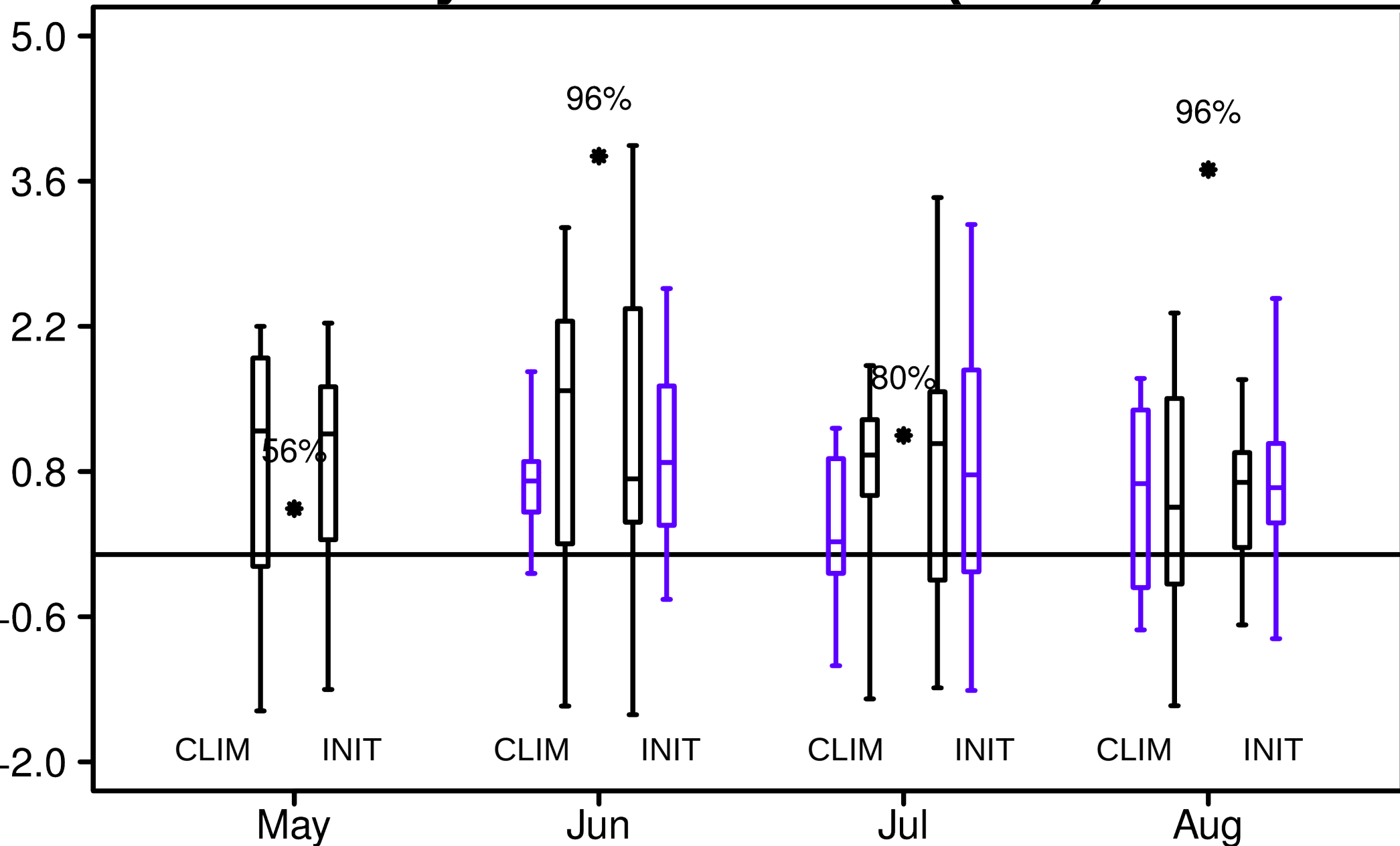
Intra-seasonality of the heat wave (2003)



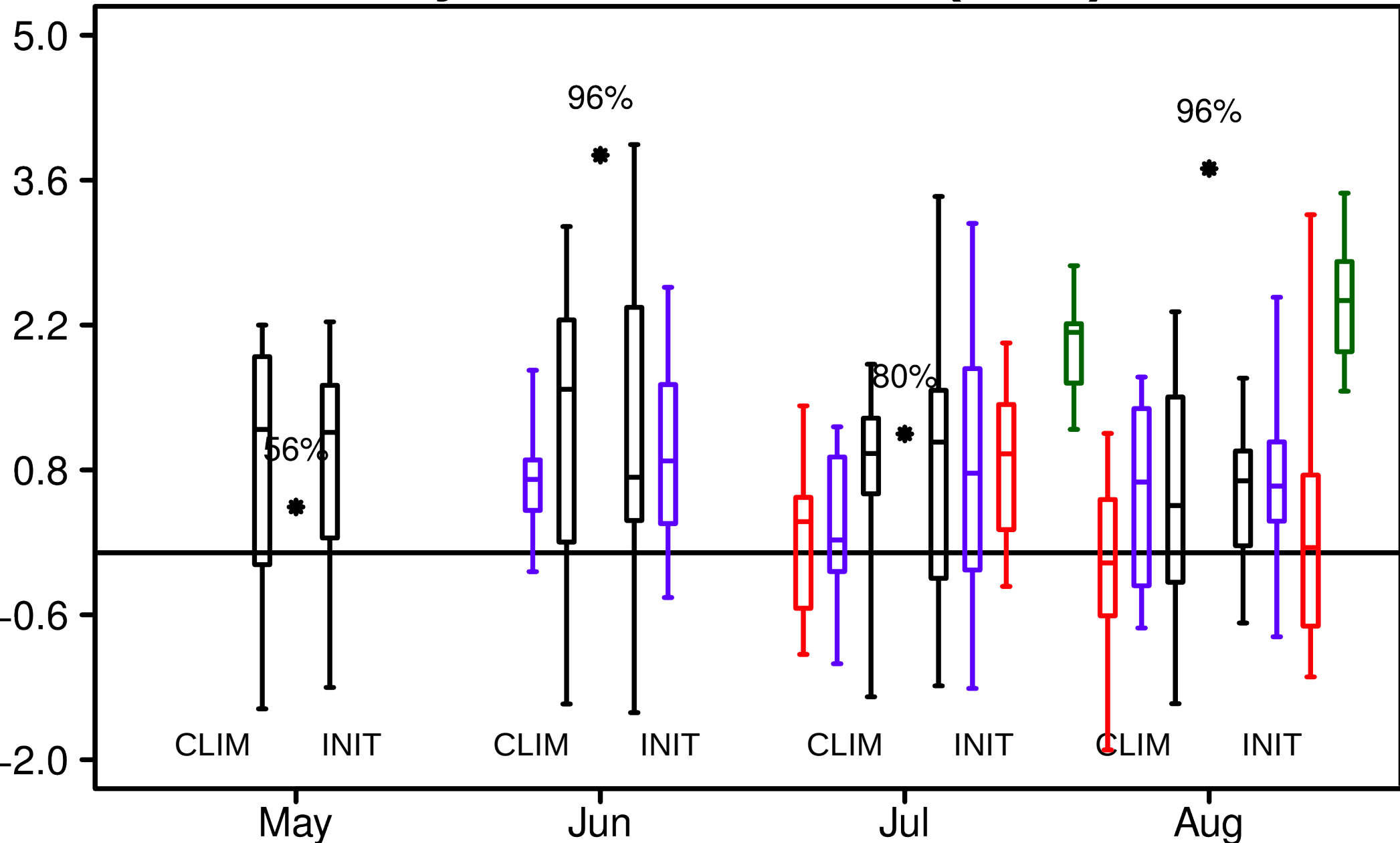
Intra-seasonality of the heat wave (2003)



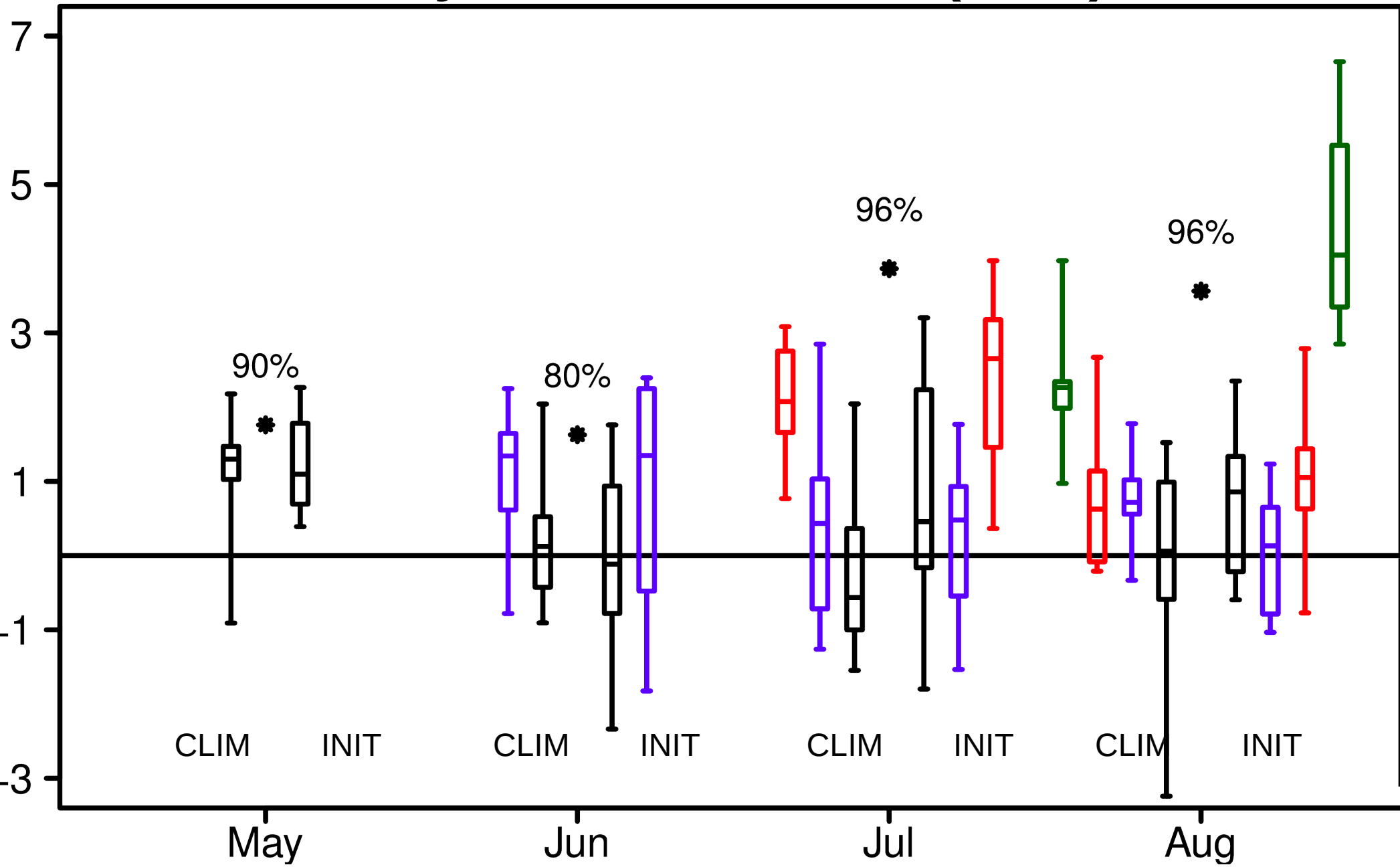
Intra-seasonality of the heat wave (2003)



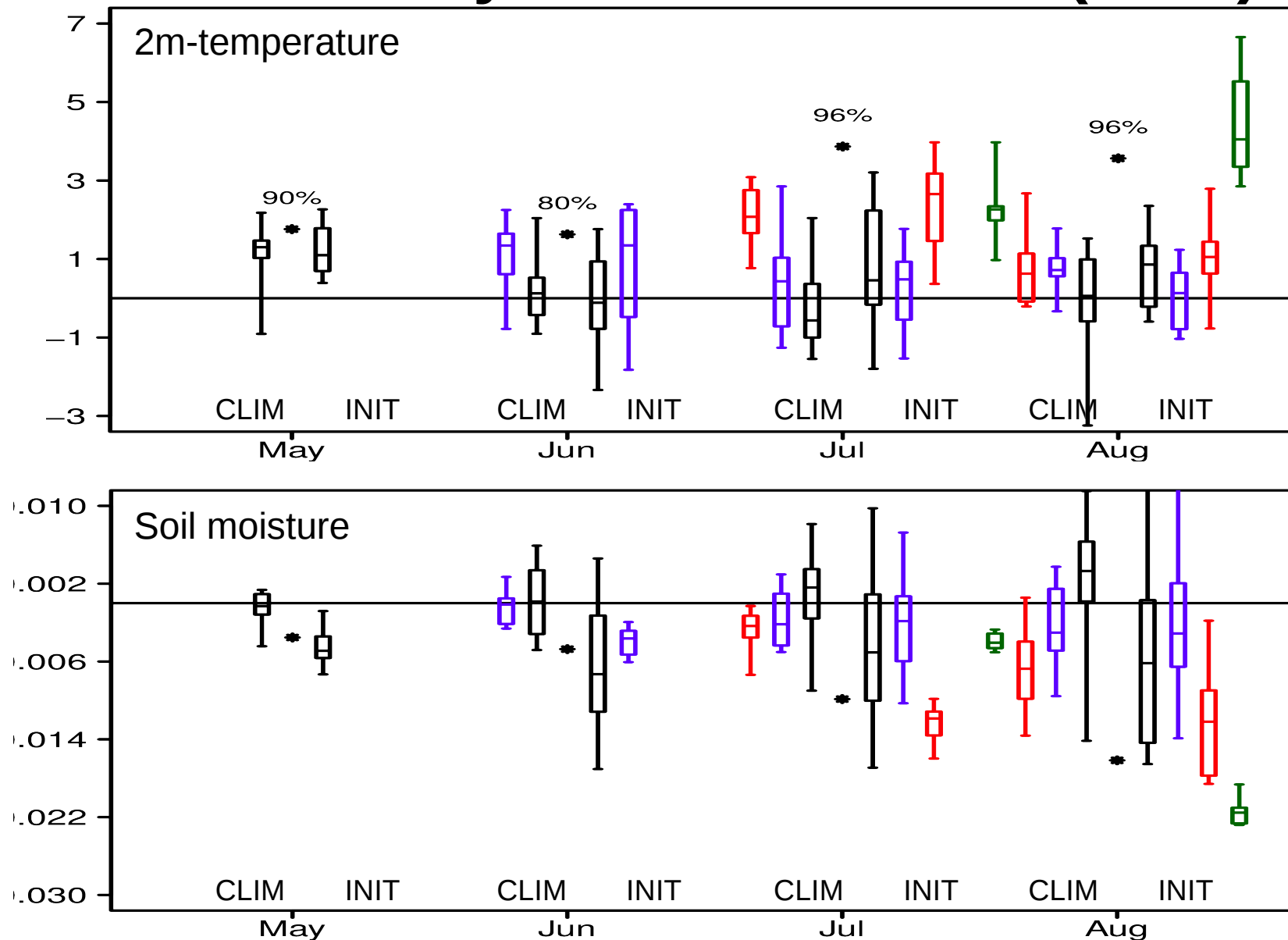
Intra-seasonality of the heat wave (2003)



Intra-seasonality of the heat wave (2010)



Intra-seasonality of the heat wave (2010)



Conclusion

- Both 2003 and 2010 heat waves are predictable
- 2003 seems to be mainly large scale driven
- In 2010 realistic soil initial conditions are necessary to forecast the heat wave

Prospects

- Investigate similar experiment with CNRM-CM (collaboration with Constantin Ardilouze)
- Weather regime analysis